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CLAIMS

1. A material for organic electroluminescence devices represented by following general formula [1]:

General formula [1]

$$\begin{pmatrix}
Y^4 \rightarrow d & X^4 & X' - (Y')_a \\
(Y^3 \rightarrow X^3 & X^2 - (Y^2)_b
\end{pmatrix}$$

wherein A represents a substituted or unsubstituted arylene group having 22 to 60 carbon atoms, X¹ to X⁴ each independently represent a substituted or unsubstituted arylene group having 6 to 30 carbon atoms, X¹ and X² may be bonded to each other, X³ and X⁴ may be bonded to each other, Y¹ to Y⁴ each independently represent an organic group represented by general formula [2], a to d each represent an integer of 0 to 2 and, when the arylene group represented by A has 26 or less carbon atoms, a+b+c+d>0 and the arylene group does not contain two or more anthracene nuclei; general formula [2] being:

General formula [2]

$$\begin{array}{c|c}
 & R^1 & R^2 \\
 & | & | & | \\
 & C = C & \longrightarrow \\
 & n & C = C & \longrightarrow \\
 & n & C = C & \longrightarrow \\
\end{array}$$
[2]

wherein R¹ to R⁴ each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 20 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms or cyano group or form a triple bond by a linkage of R¹ and R² or R³ and R⁴, Z

represents a substituted or unsubstituted aryl group having 6 to 20 carbon atoms and n represents 0 or 1.

2. A material for organic electroluminescence devices represented by following general formula [3]:

General formula [3]

$$\begin{pmatrix}
Y^4 - X^4 \\
N - B - N
\end{pmatrix}$$

$$\begin{pmatrix}
Y^3 - X^3
\end{pmatrix}$$

$$\begin{pmatrix}
Y^3 - X^3
\end{pmatrix}$$

$$\begin{pmatrix}
Y^2 - Y^2
\end{pmatrix}$$
b

wherein B represents a substituted or unsubstituted arylene group having 6 to 60 carbon atoms, X¹ to X⁴ each independently represent a substituted or unsubstituted arylene group having 6 to 30 carbon atoms, X¹ and X² may be bonded to each other, X³ and X⁴ may be bonded to each other, Y¹ to Y⁴ each independently represent an organic group represented by general formula [2], a to d each represent an integer of 0 to 2 and at least one of groups represented by B, X¹, X², X³ and X⁴ has a chrysene nucleus; general formula [2] being:

General formula [2]

$$\begin{array}{c|c}
\begin{pmatrix}
R^{1} & R^{2} \\
 & | & | \\
C & = C
\end{pmatrix}
\begin{array}{c}
R^{3} & R^{4} \\
 & | & | \\
C & = C
\end{array}$$
[2]

wherein R¹ to R⁴ each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 20 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms, cyano group or form a triple bond by a linkage of R¹ and R² or R³ and R⁴, Z

represents a substituted or unsubstituted aryl group having 6 to 20 carbon atoms and n represents 0 or 1.

3. A material for organic electroluminescence devices according to Claim 2, wherein general formula [3] means following general formula [4]:

General formula [4]

$$\begin{pmatrix}
Y^4 \\
d
\end{pmatrix}_{d} X^4$$

$$\begin{pmatrix}
Y^3 \\
c
\end{pmatrix}_{c} X^3$$

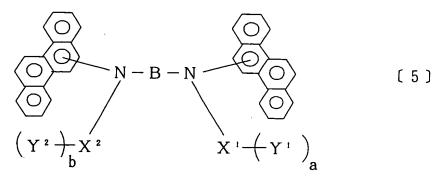
$$\begin{pmatrix}
X^1 + Y^1 \\
0
\end{pmatrix}_{a}$$

$$\begin{pmatrix}
X^2 + Y^2 \\
b
\end{pmatrix}_{b}$$

wherein X^1 to X^4 , Y^1 to Y^4 and a to d are the same as those in formula [3].

4. A material for organic electroluminescence devices according to Claim 2, wherein general formula [3] means following general formula [5]:

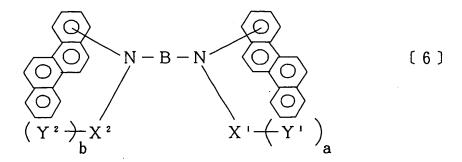
General formula [5]



wherein B, X1, X2, Y1, Y2, a and b are the same as those in formula [3].

5. A material for organic electroluminescence devices according to Claim 2, wherein general formula [3] means following general formula [6]:

General formula [6]



wherein B, X^1 , X^2 , Y^1 , Y^2 , a and b are the same as those in general formula [3].

6. A material for organic electroluminescence devices represented by following general formula [7]:

General formula [7]

$$\begin{pmatrix}
Y^4 \rightarrow X^4 \\
N - D - N
\end{pmatrix}$$

$$\begin{pmatrix}
Y^3 \rightarrow X^3
\end{pmatrix}$$

$$\begin{pmatrix}
Y^2 \leftarrow Y^2
\end{pmatrix}$$
b

wherein D represents a divalent group having a tetracene nucleus or a pentacene nucleus, X^1 to X^4 each independently represent a substituted or unsubstituted arylene group containing 6 to 30 carbon atoms, X^1 and X^2 may be bonded to each other, X^3 and X^4 may be bonded to each other, Y^1 to Y^4 each independently represent an organic group represented by general formula [2] and a to d each represent an integer of 0 to 2; general formula [2] being:

General formula [2]

$$\begin{array}{c|c}
 & R^{1} & R^{2} \\
 & | & | & | \\
 & C = C & \longrightarrow & C = C & \longrightarrow & Z
\end{array}$$

wherein R¹ to R⁴ each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 20 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms, cyano group or form a triple bond by a linkage of R¹ and R² or R³ and R⁴, Z represents a substituted or unsubstituted aryl group having 6 to 20 carbon atoms and n represents 0 or 1.

7. A material for organic electroluminescence devices according to Claim 6, wherein general formula [7] means following general formula [8]:

General formula [8]

wherein X^1 to X^4 , Y^1 to Y^4 and a to d are each independently the same as those in general formula [7], R^{51} to R^{60} each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 20 carbon atoms, a substituted or unsubstituted alkoxy group having 1 to 20 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms or cyano group and adjacent groups among the groups

represented by R^{51} to R^{60} may be bonded to each other to form a saturated or unsaturated and substituted or unsubstituted carbon ring.

8. A material for organic electroluminescence devices represented by following general formula [9]:

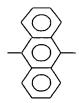
General formula [9]

$$\begin{pmatrix}
Y^4 \rightarrow d \\
X^5 \leftarrow Y^1
\end{pmatrix}_a$$

$$\begin{pmatrix}
Y^3 \rightarrow X^7
\end{pmatrix}_C$$

$$X^6 \leftarrow Y^2
\end{pmatrix}_b$$

wherein E represents a divalent group comprising an anthracene nucleus which is substituted with aryl groups or unsubstituted, X⁵ to X⁸ each independently represent a substituted or unsubstituted arylene group having 6 to 20 carbon atoms, X⁵ and X⁶ may be bonded to each other, X⁷ and X⁸ may be bonded to each other, Y¹ to Y⁴ each independently represent an organic group represented by general formula [2], a to d each represent an integer of 0 to 2 and, when the group represented by E is an unsubstituted group:



at least two of X⁵ to X⁸ contain a substituted or unsubstituted group:

general formula [2] being:

General formula [2]

$$\begin{array}{c|c}
\begin{pmatrix}
R^{1} & R^{2} \\
 & | & | \\
C & = C
\end{pmatrix}
\begin{array}{c}
R^{3} & R^{4} \\
 & | & | \\
C & = C
\end{array}$$
(2)

wherein R¹ to R⁴ each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 20 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms, cyano group or form a triple bond by a linkage of R¹ and R² or R³ and R⁴, Z represents a substituted or unsubstituted aryl group having 6 to 20 carbon atoms and n represents 0 or 1.

9. A material for organic electroluminescence devices represented by following general formula [10]:

General formula [10]

$$\begin{pmatrix}
Y^4 \rightarrow d & X^8 \\
N - A r^1 \rightarrow (A r^2) \rightarrow (A r^3) - N \\
Y^5 \rightarrow X^7$$

$$\begin{pmatrix}
Y^4 \rightarrow d & X^5 \rightarrow (Y^1) \\
X^5 \rightarrow (Y^2) \\
b
\end{pmatrix}$$

wherein Ar¹ and Ar³ each independently represents a divalent group selected from a group consisting of substituted and unsubstituted phenylene groups, substituted and unsubstituted 1,3-naphthalene groups, substituted and unsubstituted 1,8-naphthalene groups, substituted and unsubstituted fluorene groups and substituted and unsubstituted biphenyl groups, Ar² represents a divalent group selected from a group consisting of substituted and unsubstituted and unsubstituted and

unsubstituted pyrene nuclei, substituted and unsubstituted phenanthrene nuclei, substituted and unsubstituted chrysene nuclei, substituted and unsubstituted pentacene nuclei, substituted and unsubstituted naphthacene nuclei and substituted and unsubstituted fluorene nuclei, X⁵ to X8 each independently represent a substituted or unsubstituted arylene group having 6 to 20 carbon atoms, X^5 and X^6 may be bonded to each other, X⁷ and X⁸ may be bonded to each other, Y¹ to Y⁴ each independently represent an organic group represented by general formula [2], a to d each represent an integer of 0 to 2, a+b+c+d≤2, e represents 0 or 1, f represents 1 or 2 and, when Ar² represents an anthracene nucleus, a case in which a=b=c=d and Ar^1 and Ar^3 both represent p-phenylene group is excluded; general formula [2] being:

General formula [2]

$$\begin{array}{c|c}
\begin{pmatrix}
R^{1} & R^{2} \\
 & | & | \\
C & = C
\end{pmatrix}
\begin{array}{c}
R^{3} & R^{4} \\
 & | & | \\
C & = C
\end{array}$$
(2)

wherein R¹ to R⁴ each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 20 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms, cyano group or form a triple bond by a linkage of R¹ and R² or R³ and R⁴, Z represents a substituted or unsubstituted aryl group having 6 to 20 carbon atoms and n represents 0 or 1.

10. A material for organic electroluminescence devices represented by following general formula [11]:

General formula [11]

$$\begin{pmatrix}
Y^4 \\
d
\end{pmatrix}_{d} X^4 \\
N - F - N$$

$$\begin{pmatrix}
X^1 + Y^1 \\
a
\end{pmatrix}_{a}$$

$$\begin{pmatrix}
Y^3 + X^3
\end{pmatrix}_{b} X^2 + Y^2
\end{pmatrix}_{b}$$

wherein F represents a substituted or unsubstituted arylene group having 6 to 21 carbon atoms, X^1 to X^4 each independently represent a substituted or unsubstituted arylene group having 6 to 30 carbon atoms, X^1 and X^2 may be bonded to each other, X^3 and X^4 may be bonded to each other, Y^1 to Y^4 each independently represent an organic group represented by general formula [2], a to d each represent an integer of 0 to 2, and a+b+c+d>0; general formula [2] being:

General formula [2]

$$\begin{array}{c|c}
 & R^{1} & R^{2} \\
 & | & | & | \\
 & C = C & \longrightarrow & C = C & \longrightarrow Z
\end{array}$$
(2)

wherein R¹ to R⁴ each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 20 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms, cyano group or form a triple bond by a linkage of R¹ and R² or R³ and R⁴, Z represents a substituted or unsubstituted aryl group having 6 to 20 carbon atoms and n represents 0 or 1.

11. A material for organic electroluminescence devices according to Claim 10, wherein the group represented by F in general formula [11] is a group represented by following general formula [12], general formula [13] or general formula [14]:

General formula [12]

General formula [13]

wherein $R^{5'}$ to $R^{24'}$ each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 20 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms or cyano group and adjacent groups among the groups represented by $R^{5'}$ to $R^{24'}$ my be bonded to each other to form a saturated or unsaturated carbon ring;

General formula [14]

wherein $R^{25'}$ to $R^{34'}$ each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 20 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms or cyano group and adjacent groups among the groups represented by $R^{5'}$ to $R^{24'}$ my be bonded to each other to form a saturated or unsaturated carbon ring.

- 12. A material for organic electroluminescence devices according to any of Claims 1 to 11, which is a light emitting material for organic electroluminescence devices.
- 13. An organic electroluminescence device which comprises a light emitting layer or a plurality of thin films of organic compounds comprising a light emitting layer disposed between a pair of electrodes, wherein at least one of the thin films of organic compounds is a layer comprising a material for organic luminescence devices described in any of Claims 1 to 11.
- 14. An organic electroluminescence device which comprises a light emitting layer or a plurality of thin films of organic compounds comprising a light emitting layer disposed between a pair of electrodes, wherein a layer comprising a material for organic electroluminescence devices described in any of Claims 1 to 11 as at least one material selected from a group consisting of a hole injecting material, a hole transporting material and a doping material is disposed between the pair of electrodes.

- 15. An organic electroluminescence device which comprises a light emitting layer or a plurality of thin films of organic compounds comprising a light emitting layer disposed between a pair of electrodes, wherein the light emitting layer comprises 0.1 to 20% by weight of a material for organic luminescence devices described in any of Claims 1 to 11.
- 16. An organic electroluminescence device which comprises a light emitting layer or a plurality of thin films of organic compounds comprising a light emitting layer disposed between a pair of electrodes, wherein one or more materials selected from a group consisting of a hole injecting material, a hole transporting material and a doping material each independently comprise 0.1 to 20% by weight of a material for organic electroluminescence devices described in any of Claims 1 to 11.
- 17. An organic electroluminescence device which comprises a light emitting layer or a plurality of thin films of organic compounds comprising a light emitting layer disposed between a pair of electrodes, wherein the light emitting layer is a layer comprising a stilbene derivative and a material for organic electroluminescence devices described in any of Claims 1 to 11.
- 18. An organic electroluminescence device according to any of Claims 11 to 17, wherein a layer comprising an aromatic tertiary amine derivative and/or a phthalocyanine derivative is disposed between a light emitting layer and an anode.

- 19. An organic electroluminescence device according to any of Claims 10 and 11, wherein an energy gap of the material for organic electroluminescence devices represented by general formula [11] is smaller than an energy gap of a host material by 0.07 eV or greater.
- 20. A novel compound represented by following general formula [11']:

 General formula [11']

$$\begin{pmatrix} Y^4 - X^4 \\ Y^3 - X^3 \end{pmatrix}_{D} X^4 - F - N \\ X^2 - Y^2 \end{pmatrix}_{D}$$

$$\begin{pmatrix} Y^4 - X^4 \\ Y^2 - Y^2 \end{pmatrix}_{D}$$

wherein F represents a group represented by general formula [14], X^1 to X^4 each independently represent a substituted or unsubstituted arylene group having 6 to 30 carbon atoms, X^1 and X^2 may be bonded to each other, X^3 and X^4 may be bonded to each other, Y^1 to Y^4 each independently represent an organic group represented by general formula [2], a to d each represent an integer of 0 to 2, and a+b+c+d>0; general formula [14] being:

General formula [14]

wherein R²⁵' to R³⁴' each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 20 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms or cyano group and adjacent groups among the groups represented by R⁵' to R²⁴' my be bonded to each other to form a saturated or unsaturated carbon ring; and

general formula [2] being:

General formula [2]

$$\begin{array}{c|c}
\begin{pmatrix}
R^{1} & R^{2} \\
 & | & | \\
C & = C
\end{pmatrix}
\begin{array}{c}
R^{3} & R^{4} \\
 & | & | \\
C & = C
\end{array}$$
[2]

wherein R¹ to R⁴ each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 20 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms, cyano group or form a triple bond by a linkage of R¹ and R² or R³ and R⁴, Z represents a substituted or unsubstituted aryl group having 6 to 20 carbon atoms and n represents 0 or 1.

21. A process for producing a material for organic electroluminescence devices which comprises reacting, in a presence of a catalyst comprising a phosphine compound and a palladium compound and a base, a primary amine or a secondary amine represented by following general formula [15]:

$$R(NR'H)_k$$
 [15]

wherein k represents an integer of 1 to 3; when k represents 1, R and R' represent hydrogen atom, an alkyl group or a substituted or unsubstituted aryl group; and when k represents 2 or 3, R represents an alkylene group

or substituted or unsubstituted arylene group and R' represents hydrogen atom, an alkyl group or a substituted or unsubstituted aryl group, with an aryl halide represented by following general formula [16]:

$$Ar(X)_{m} [16]$$

wherein Ar represents a substituted or unsubstituted aryl group, X represents F, Cl, Br or I and m represents an integer of 1 to 3, and producing a material for organic electroluminescence devices comprising an arylamine compound.

22. A process for producing a material for organic electroluminescence devices according to Claim 21, wherein the arylamine compound is a compound represented by following general formula [17]:

General formula [17]

$$\begin{pmatrix}
Y^4 \rightarrow d & X^4 & X^1 \leftarrow Y^1 \\
N - F - N & X^2 \leftarrow Y^2
\end{pmatrix}_{b}$$

$$\begin{pmatrix}
Y^4 \rightarrow d & X^4 & X^1 \leftarrow Y^1 \\
X^2 \leftarrow Y^2 & Y^2
\end{pmatrix}_{b}$$

wherein F represents a substituted or unsubstituted arylene group having 6 to 60 carbon atoms, X^1 to X^4 each independently represent a substituted or unsubstituted arylene group having 6 to 30 carbon atoms, X^1 and X^2 may be bonded to each other, X^3 and X^4 may be bonded to each other, Y^1 to Y^4 each independently represent an organic group represented by general formula [2], a to d each represent an integer of 0 to 2, and a+b+c+d>0; general formula [2] being:

General formula [2]

$$\begin{array}{c|c}
\begin{pmatrix}
R & R^2 \\
 & | & | \\
C & C
\end{pmatrix}
\begin{array}{c}
R^3 & R^4 \\
 & | & | \\
C & C
\end{array}$$

$$\begin{array}{c|c}
C & C
\end{array}$$

$$\begin{array}{c|c}
C & C
\end{array}$$

wherein R¹ to R⁴ each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 20 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms, cyano group or form a triple bond by a linkage of R¹ and R² or R³ and R⁴, Z represents a substituted or unsubstituted aryl group having 6 to 20 carbon atoms and n represents 0 or 1.

23. A process for producing a material for organic electroluminescence device according to Claim 21, wherein the phosphine compound is a trialkylphosphine compound, a triarylphosphine compound or a diphosphine compound.